

WHAT IS CLAIMED IS:

1. A semiconductor module comprising:

an insulating base material provided with a conductor circuit;

a semiconductor element formed on said insulating base material;

5 and

an insulator disposed in contact with said insulating base material and said semiconductor element;

wherein said insulating base material is provided with minute projections on a surface thereof that is in contact with said insulator.

10 2. The semiconductor module as set forth in Claim 1, wherein said insulator is a sealing resin for sealing a semiconductor element therein.

3. The semiconductor module as set forth in Claim 1, wherein said insulator is an adhesive provided between said semiconductor element and said insulating base material.

15 4. The semiconductor module as set forth in Claim 1, wherein a plurality of crater-shaped recesses is formed on a surface of said insulating base material that is in contact with said insulator.

5. The semiconductor module as set forth in Claim 4, wherein a diameter of said crater-shaped recess is in a range of 0.1 μm to 1 μm .

20 6. The semiconductor module as set forth in Claim 1, wherein said minute projections include a plurality of projections of 1 nm to 20 nm in average diameter.

7. The semiconductor module as set forth in Claim 1, wherein said minute projections include a plurality of projections formed in a number density of not less than $0.5 \times 10^3 \mu\text{m}^{-2}$.

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8. A semiconductor module comprising:

an insulating base material provided with a conductor circuit;

a semiconductor element formed on said insulating base material;

and

5 an insulator disposed in contact with said insulating base material and said semiconductor element;

wherein a value of y/x is not less than 0.4, where x represents a detected intensity at a binding energy of 284.5 eV and y represents a detected intensity at a binding energy of 286 eV, by an X-ray
10 photoelectric spectroscopy spectrum in the proximity of a surface of said insulating base material that is in contact with said insulator.

9. A semiconductor module comprising:

an insulating base material provided with a conductor circuit;

a semiconductor element formed on said insulating base material;

15 and

an insulator disposed in contact with said insulating base material and said semiconductor element;

wherein an exposed region of said insulating base material in contact with said insulator makes a contact angle of 30 degrees to 120
20 degrees with respect to pure water.

10. A semiconductor module comprising:

an insulating base material provided with a conductor circuit;

a semiconductor element formed on said insulating base material;

and

an insulator disposed in contact with said insulating base material and said semiconductor element;

wherein said insulating base material is constituted essentially of a photopolymerizable thermosetting resin containing a polyfunctional oxetane compound or an epoxy compound.

11. The semiconductor module as set forth in Claim 1, wherein said semiconductor element is a bare chip and said insulator is constituted essentially of a sealing resin for sealing said bare chip therein.

12. The semiconductor module as set forth in Claim 8, wherein said semiconductor element is a bare chip and said insulator is constituted essentially of a sealing resin for sealing said bare chip therein.

13. The semiconductor module as set forth in Claim 9, wherein said semiconductor element is a bare chip and said insulator is constituted essentially of a sealing resin for sealing said bare chip therein.

14. The semiconductor module as set forth in Claim 10, wherein said semiconductor element is a bare chip and said insulator is constituted essentially of a sealing resin for sealing said bare chip therein.

15. A module comprising:

a base material;

an element formed on said base material; and

an insulator disposed in contact with said base material and said element;

wherein said base material is provided with minute projections on a surface thereof that is in contact with said insulator.

5 16. The module as set forth in Claim 15, wherein a plurality of crater-shaped recesses is formed on a surface of said base material that is in contact with said insulator.

10 17. The module as set forth in Claim 15, wherein said minute projections include a plurality of projections of 1 nm to 20 nm in average diameter.

18. A method of manufacturing said semiconductor module set forth in Claim 1, comprising:

15 applying plasma processing with a plasma gas containing an inert gas to a surface of said insulating base material provided with a conductor circuit without applying a bias to said insulating base material; and

 forming a semiconductor element and an insulator in contact with said semiconductor element on said insulating base material.

20 19. A method of manufacturing said semiconductor module set forth in Claim 8, comprising:

 applying plasma processing with a plasma gas containing an inert gas to a surface of said insulating base material provided with a conductor circuit without applying a bias to said insulating base material; and

forming a semiconductor element and an insulator in contact with said semiconductor element on said insulating base material.

20. A method of manufacturing said semiconductor module set forth in Claim 9, comprising:

5 applying plasma processing with a plasma gas containing an inert gas to a surface of said insulating base material provided with a conductor circuit without applying a bias to said insulating base material; and

10 forming a semiconductor element and an insulator in contact with said semiconductor element on said insulating base material.

21. A method of manufacturing said semiconductor module set forth in Claim 10, comprising:

15 applying plasma processing with a plasma gas containing an inert gas to a surface of said insulating base material provided with a conductor circuit without applying a bias to said insulating base material; and

 forming a semiconductor element and an insulator in contact with said semiconductor element on said insulating base material.

20 22. A method of manufacturing said module set forth in Claim 15, comprising:

 applying plasma processing with a plasma gas containing an inert gas to a surface of said base material without applying a bias to said base material; and

25 forming an element and an insulator in contact with said element on said base material.